

## Claims

1. Method for mixing at least two fluids in a micromixing reactor constructed from a stack of films or thin plates,  
wherein a mixing chamber extends transverse to the film planes, and the fluids for mixing are introduced separately and adjacent one another on the film planes transverse to the longitudinal axis of the mixing chamber, so that the mixing of the fluids substantially takes place directly on their introduction into the mixing chamber, and  
wherein the resulting mixture is tempered at least on a section of the circumference of the mixing chamber by a tempering means.
2. Method according to claim 1, wherein a catalyst or an auxiliary substance supporting the mixing is added in partial amounts to the fluids supplied on the film planes, and/or the fluids are guided over a catalyst provided on the inside walls of the supply passages and/or of the mixing chamber.
3. Micromixing reactor for mixing at least two fluids constructed from a stack of films or thin plates,  
wherein a mixing chamber (9, 90) extends vertical to the film planes,  
supply passages (10) for the fluids to be mixed are formed in the planes of the films (F), the mouth openings of which supply passages (10) are provided in the mixing chamber adjacent or above one another, and  
wherein the mixing chamber (9) has a tempering means (6, 60) on at least one portion of its circumference.
4. Micromixing reactor according to claim 3, wherein the mixing chamber (90) has a long cross-sectional shape and the supply passages (10) open into this in the area of a narrow side of the mixing chamber.
5. Micromixing reactor according to claim 4, wherein on at least one broad side of the mixing chamber (90) a tempering passage (60) is formed extending parallel to the mixing chamber.

6. Micromixing reactor according to one of the claims 3 to 5, wherein the supply passages (10) for the fluids to be mixed are arranged towards the opening area at an angle to one another, and are shaped tapered towards the mouth opening.
7. Micromixing reactor according to one of claims 3 to 6, wherein the supply passages (10) for the fluids to be mixed are formed at an angle to one another in the axial direction of the mixing chamber (9, 90).
8. Micromixing reactor according to one of claims 3 to 7, wherein the mixing chamber (9) is formed approximately annular in cross section, and is delimited from the tempering means (7) on the inner circumference, wherein on approximately diametrically opposite sides of the mixing chamber, supply passages (10) open for the fluids to be mixed.
9. Micromixing reactor according to claim 8, wherein on the outer circumference of the mixing chamber (9) between the supply passages (10), tempering passages (6) are formed extending parallel to the mixing chamber.
10. Micromixing reactor according to one of claims 3 to 9, wherein in the axial direction of the mixing chamber between the overlapping mixing areas, partition elements (30) are provided, which extend in the mouth area parallel to the film planes.
11. Micromixing reactor according to one of claims 8 to 10, wherein in the circumferential direction of the mixing chamber (9) before the individual mixing areas a shield screen (31) is arranged, which extends approximately parallel to the axis of the mixing chamber (9).
12. Micromixing reactor according to one of claims 8 to 11, wherein the tubular tempering cylinder (7) is formed in the mixing chamber (9) by holes and wall sections of the individual plates or films (F) stacked over one another, and the wall sections of the tempering cylinder are held by moulded-on bridges (13).